Design 101 & Renovation 101 Teams

Bringing School Renovations to Life for our Students Though Real-World STEM Applications

It's about Sustainability.
SUSTAINABILITY.FCPS.NET

Instructional Goals

- Incorporate STEM instruction through exposure and hands-on experience and understanding of the benefits and functionality of sustainable, high performing components of a renovation.
- Acquaint students with architectural and engineering career pathways
- Apply content students are *currently* learning in math and science to on site renovation project
- Develop leadership skills in students who serve as "behind the scenes" liaisons to their school community

Content Items Discussed

- Phasing and schedules
- Daylighting
- Permeable pavement
- Stormwater runoff
- On-site biolfiltration
- Increased R-values
- Scale use and practice
- Passive solar energy (clerestory, SolaTubes)
- Low plumbing fixtures
- CO_2 sensors
- Occupancy light sensors
- Incadescent vs LED exit signs

- VRV HVAC system
- Improved green space for outdoor classroom use
- Orientation
- Design choices
- Native landscaping
- Site-specific issues
  - % and sq ft increase
  - Discoveries about school history
  - Cost per sq ft (who pays?)
  - New codes
  - Life cycle analysis
  - n programming

Breckenridge Renovation 101

Site Plans and Floor Plans

Role of General Contractor

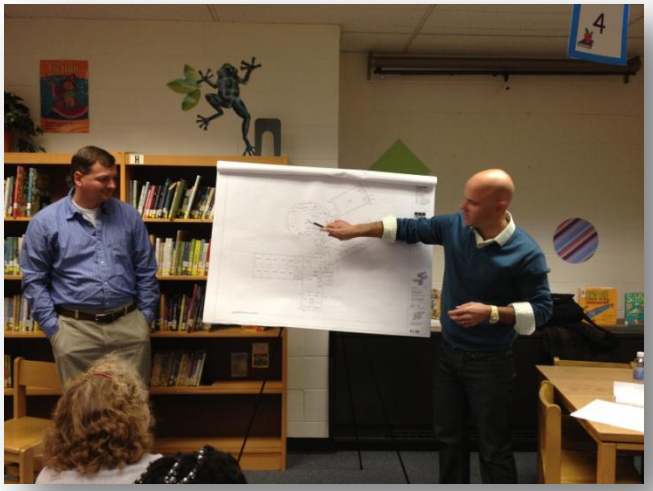
Project Surprises

Clays Mill Renovation 101

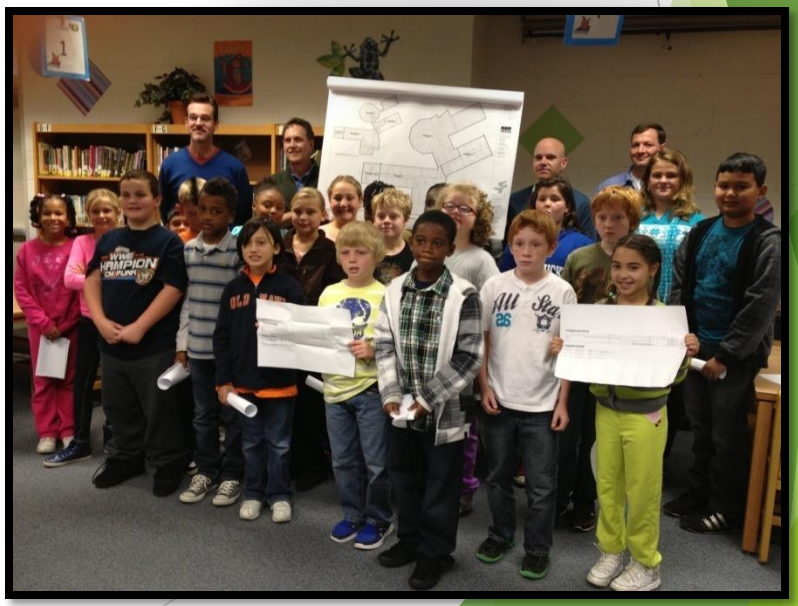
ICF Construction

What's above the ceiling?

Deep Springs Design 101

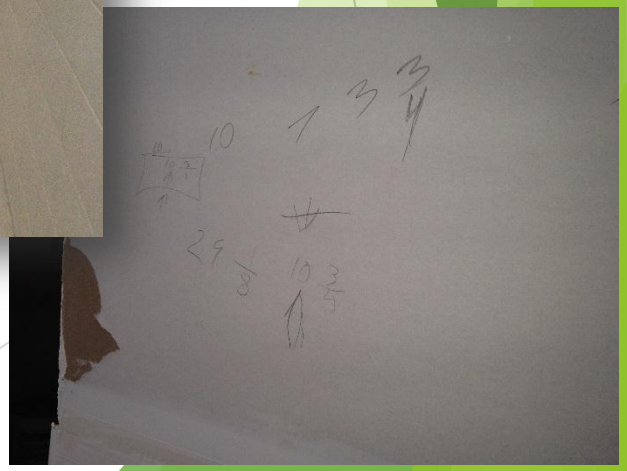


Reading Floor Plans and Site Plans



Garden Springs Design/ Renovation 101

Evidence of on-the-job math



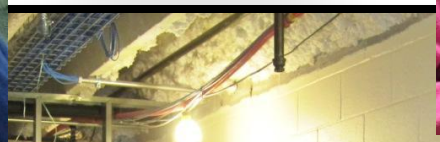
How do legends and codes help you analyze floor plans and site plans?

Glendover Design 101

Soliciting student feedback on design decisions.

Matching brick

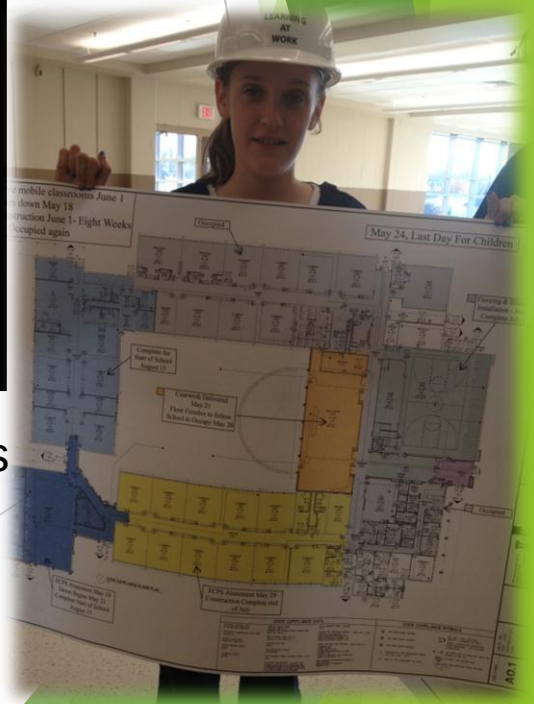
James Lane Allen Design/Renovation 101



How does a school building manage technology demands?

Building orientation

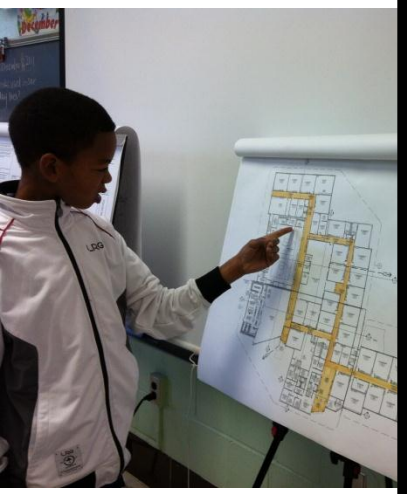
Mary Todd Renovation 101

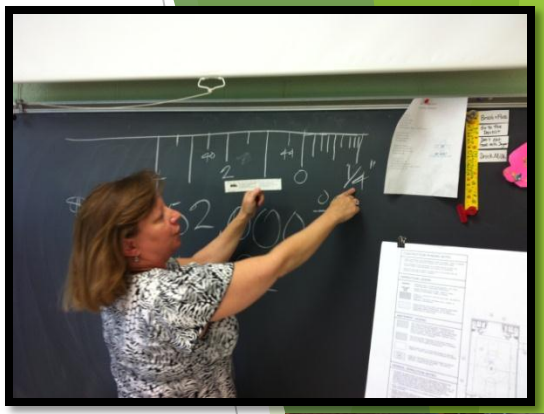


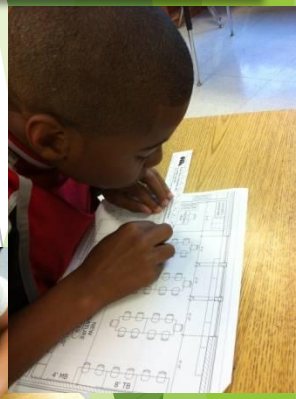
What hardware and software technologies do architects and engineers utilize?

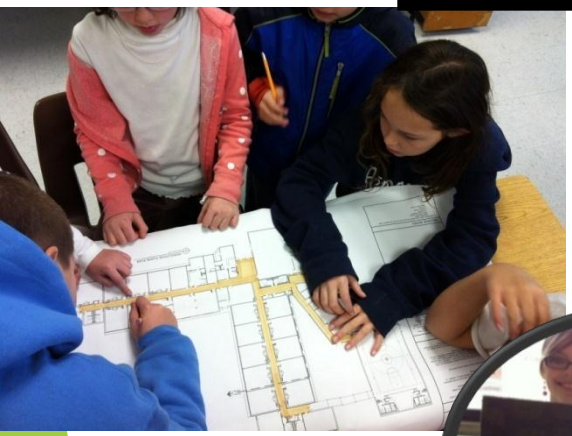
Meadowthorpe Design/ Renovation 101

Why is scaling so important to architects and how are scales used?







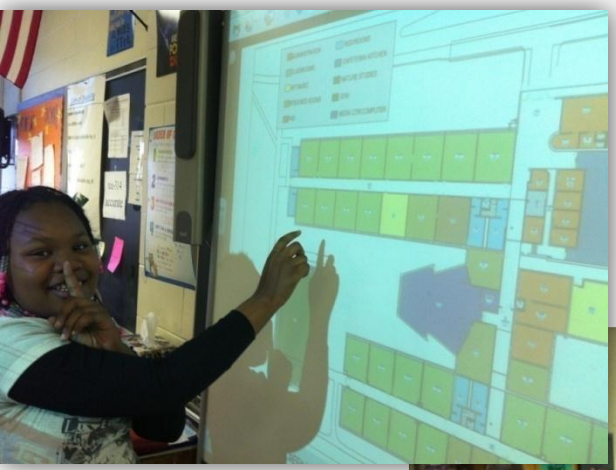


Carpet samples

Millcreek Renovation 101

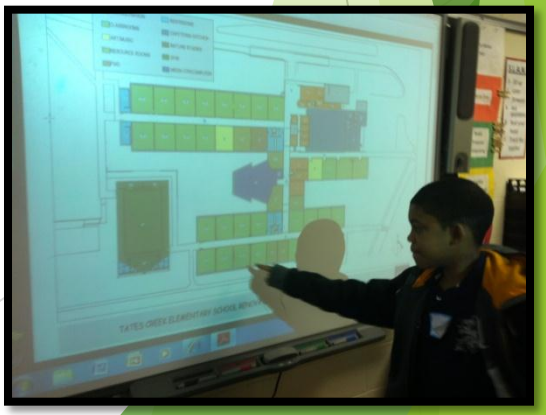
How do heat and air conditioning get to classrooms?

Tates Creek Elementary Design/ Renovation 101



What does it take to keep gym walls and ceiling structurally sound?

How are design decisions made?

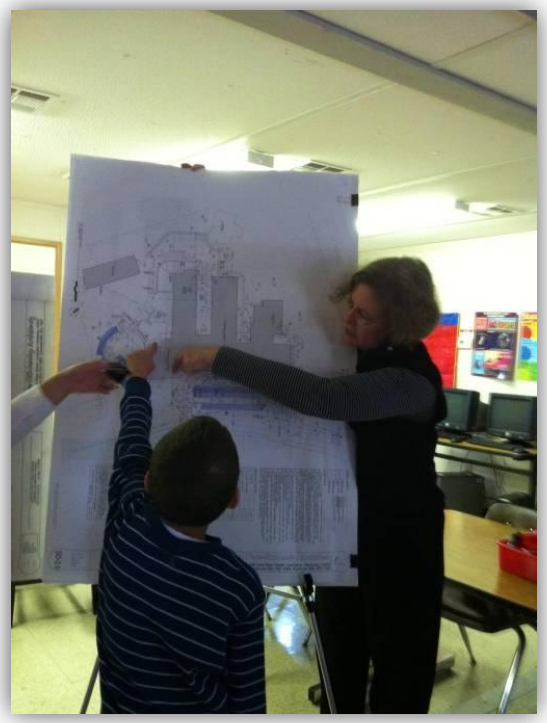


Cardinal Valley Renovation 101

Tate Hill Jacobs Architects

Stonewall Design 101

Tate Hill Jacobs Architects



Stonewall Renovation 101

Tate Hill Jacobs Architects

Jessie Clark MS Design 101

Tate Hill Jacobs Architects

Jessie Clark MS Renovation 101

Tate Hill Jacobs Architects

Faculty Presentation

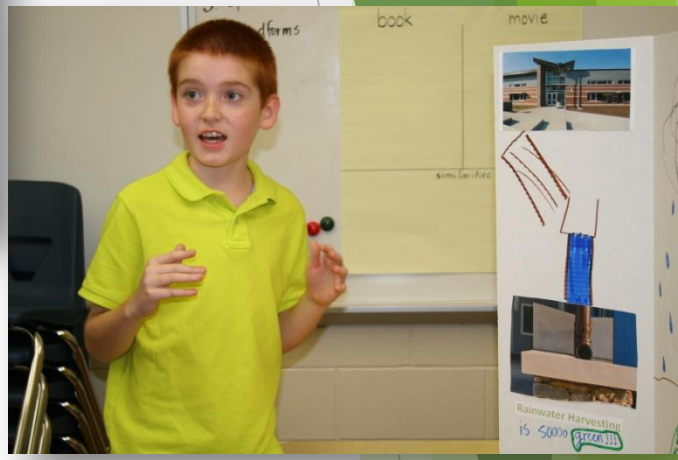
- Who are our architects & engineers?
- What are scheduling phases for our project?
- Why does it take 18 months to complete a project?
- What are site plans, floor plans and architectural plans?
- How do architects use science, art and math?
- How will we conserve energy through lighting?
- How do we conserve energy through improved HVAC?
- How will we conserve energy through improved insulation?
  - Before/after R-value
- How will sustainability be improved on our campus through stormwater management?
- How were design decisions made?
- What are some unexpected challenges of our school's renovation?

Living Lab Team
Wellington Elementary

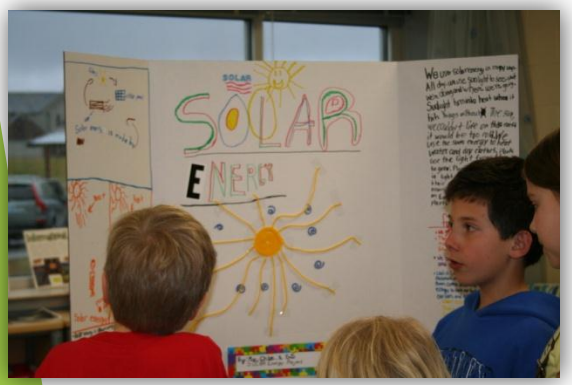
ICF construction

- ICF construction
- Low VOC materials
- Cistern recycled non-potable water
- Permeable pavers
- Rain garden
- PV panels (15kW)
- Light shelves/Sun Shades/SolaTubes/ Daylighting
- Solar Thermal
- CO_2 sensors
- Bldg orientation

Solar Tubes



Stormwater management



Solar Thermal Array

GreenScreen

Mrs. Moore,
Thank you so much for leting us be in the team! You have made the rentavation so much fun! It is so awsome to be on the team! It is awsome to be able to go! The tour was super great!! Thank you for getting us to meet you in your time! It was awsome to meet with the people who helped and designed the building! You are awsome for letting us make a video!

your friends,
Eryn and Averi